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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/735,638	12/16/2003	Cheng Sièw Tay	P-6121-US	3526

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EXAMINER

NORRIS, JEREMY C

ART UNIT	PAPER NUMBER
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2841

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/20/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/735,638

Applicant(s)

TAY ET AL.

Examiner

Jeremy C. Norris

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 December 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4 and 6-38 is/are pending in the application.
- 4a) Of the above claim(s) 21-38 is/are withdrawn from consideration.
- 5) ☐ Claim(s) 8-17 is/are allowed.
- 6) ☒ Claim(s) 1-4, 6, 7 and 18-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- ☐ Notice of Informal Patent Application
- ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-4, 6 and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by US 6,448,504 B1 (Taguchi).

Taguchi discloses, referring primarily to figures 3A-B, a printed circuit board comprising: pads (12) suitable to be soldered to respective solder-balls of a device, where a perimeter of a pad has a crack initiation point (14) at a location where cracks in a solder-ball are anticipated to start after said solder-ball is soldered to said pad, and where said pad merges with a trace (11) along a portion of said perimeter that does not include a vicinity of said crack initiation point, wherein said portion is not longer than the length of one quarter of said perimeter [claim 1], wherein at least one of said pads is a metal-defined pad [claim 2], wherein at least one of said pads is a solder-mask (10)defined pad [claim 3], wherein at least one of said pads is substantially round [claim 4], wherein said pad is substantially round and a tangent to said perimeter at a middle point of said portion is substantially parallel to a crack propagation direction for said solder-ball [claim 6], wherein a straight line joining said crack initiation point and a middle point of said portion is parallel to a crack propagation direction for said solder-ball [claim 7].

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taguchi.

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Taguchi discloses, a printed circuit board, the printed circuit board comprising: pads (12) soldered to solder-balls of said device, where a perimeter of a pad has a crack initiation point (14) at a location where cracks in a solder-ball are anticipated to start after said solder-ball is soldered to said pad, and where said pad merges with a respective trace (11) along a portion of said perimeter that does not include a vicinity of said crack initiation point, wherein said portion is not longer than the length of one quarter of said perimeter. Taguchi does not specifically state that said printed circuit board has a voltage monitor installed thereon [claim 18]. However, the Examiner takes Official Notice that it is well known in the art to install voltage monitors on printed circuit boards. Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to install a voltage monitor on the device of Taguchi as is known in the art. The motivation for doing so would have been to assure that proper voltage is delivered to the device. Additionally, the modified invention of Taguchi teaches, wherein at least one of said pads is a metal-defined pad [claim 19], wherein said printed circuit board is a motherboard [claim 20].

Allowable Subject Matter

Claims 8-17 are allowed.

The following is a statement of reasons for the indication of allowable subject matter: Claim 8 states the limitation "said pads having microvias located therein, where a center of a microvia of a pad is farther than a center of said pad from a crack initiation point located on a perimeter of said pad at a location where crack in a solder-ball are anticipated to start after said solder-ball is soldered to said pad". This limitation, in

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conjunction with the other claimed features, was neither found to be disclosed in, nor suggested by, the prior art. Claim 15 states the limitation "said pads having microvias located therein, where a center of a microvia of a pad is farther than a center of said pad from a crack initiation point located on a perimeter of said pad at a location where cracks in a solder-ball arc anticipated to start after said solder-ball is soldered to said pad". This limitation, in conjunction with the other claimed features, was neither found to be disclosed in, nor suggested by, the prior art.

Response to Arguments

Applicant's arguments with respect to claims 1-4, 6, 7, and 18-20 have been considered but are moot in view of the new ground(s) of rejection.

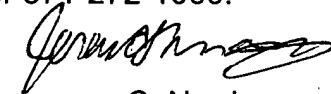
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeremy C. Norris whose telephone number is 571-272-1932. The examiner can normally be reached on Monday - Friday, 9:30 am - 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dean Reichard can be reached on 571-272-1984. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



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Art Unit 2841

JCSN